

1 What is claimed is:
2

1 1. In a disk drive control system comprising a micro-controller, a micro-
2 controller cache system having a cache memory and a cache-control subsystem, and a
3 buffer manager communicating with the micro-controller cache system and a remote
4 memory, a method for improving fetch operations between the micro-controller and the
5 remote memory via the buffer manager, the method comprising:

6 receiving a data-request from the micro-controller in the cache control
7 subsystem wherein the data-request comprises a request for at least one of an
8 instruction code and non-instruction data;

9 providing the requested data to the micro-controller if the requested data
10 reside in the cache memory;

11 determining if the received data-request is for a non-instruction data if the
12 requested data does not reside in the cache memory;

13 fetching the non-instruction data from the remote memory by the micro-
14 controller cache system via the buffer manager; and

15 bypassing the cache memory to preserve the contents of the cache memory
16 and provide the fetched non-instruction data to the micro-controller.

1 2. The method of claim 1, wherein the determining is based on a signal
2 received from the micro-controller.

1 3. The method of claim 2, wherein the fetching further comprises:
2 transmitting a cache control subsystem data-request from the cache control
3 subsystem to the buffer manager;
4 accessing the remote memory by the buffer manager; and
5 retrieving the cache control subsystem requested data from the remote
6 memory.

1 4. The method of claim 1, wherein the buffer manager is in communication
2 with a plurality of control system clients and provides client-requested data to the clients
3 from the remote memory.

1 5. The method of claim 4, wherein the plurality of control system clients
2 comprises at least one of a disk subsystem, an error correction code subsystem, and a host
3 interface subsystem.

1 6. The method of claim 1, wherein the remote memory comprises a dynamic
2 random access memory (DRAM).

1 7. The method of claim 1, further comprising:
2 determining if the received data-request is for an instruction code if the
3 requested data does not reside in the cache memory; and
4 filling the cache memory if the received data-request is for an
5 instruction code.

1 8. The method of claim 7, wherein the filling the cache memory comprises a
2 burst fill of the cache memory.

- 1 9. A disk drive control system comprising:
2 a micro-controller; and
3 a micro-controller cache system in communication with the micro-
4 controller and comprising a cache memory and a cache-control subsystem,
5 wherein the micro-controller cache system is adapted to:
6 a) receive a data-request from the micro-controller in the cache
7 control subsystem wherein the data request comprises a request for
8 at least one of an instruction code and non-instruction data,
9 b) provide the requested data to the micro-controller if the requested
10 data reside in the cache memory,
11 c) determine if the received data-request is for a non-instruction data
12 if the requested data does not reside in the cache memory,
13 d) fetch the non-instruction data from the remote memory via a buffer
14 manager adapted to provide the micro-controller cache system with
15 micro-controller requested data stored in a remote memory, and
16 e) bypass the cache memory to preserve the contents of the cache memory
17 and to provide the fetched non-instruction data to the micro-controller.

- 1 10. The disk drive control system of claim 9, wherein the cache control
2 subsystem it is further adapted to determine if the received data-request is for a non-
3 instruction data based on a signal received from the micro-controller.

- 1 11. The disk drive control system of claim 10, wherein the micro-controller
2 cache system is further adapted to:
3 a) transmit a cache control subsystem data-request from the cache control
4 subsystem to the buffer manager;
5 b) access the remote memory via the buffer manager; and
6 c) receive the cache control subsystem requested data from the remote
7 memory.

- 1 12. The disk drive control system of claim 9, wherein the buffer manager is in
2 communication with a plurality of control system clients and provides client-requested
3 data to the clients from the remote memory.

1 13. The disk drive control system of claim 12, wherein the plurality of control
2 system clients comprises at least one of a disk subsystem, an error correction code
3 subsystem, and a host interface subsystem.

1 14. The disk drive control system of claim 9, wherein the remote memory
2 comprises a dynamic random access memory (DRAM).

1 15. The disk drive control system of claim 9, wherein the micro-controller
2 cache system is further adapted to:

3 determine if the received data-request is for an instruction code if the
4 requested data does not reside in the cache memory; and

5 fill the cache memory if the received data-request is for an instruction code.

1 16. The disk drive control system of claim 15, wherein the cache memory is
2 filled with a burst fill.